

1 October 26, 2001

2 Express Mail Label No.: ET849028933US

PATENT

3

4

5

6

7

8

9

10

11

12

UNITED STATES PATENT APPLICATION

13

14

of

15

16

INVENTOR: STANLEY J. CHECKETTS

17

A Citizen of the United States

18

900 East Canyon Road

19

PROVIDENCE, UTAH 84332

20

21

22

for

23

24

25

OSCILLATORY AMUSEMENT RIDE

26

1 BACKGROUND OF THE INVENTION

2
3 FIELD OF THE INVENTION

4 This invention relates to an amusement ride for accelerating and decelerating a
5 participant where the initial force provided for the ride is generated by downward movement of
6 the participant.

7
8 DESCRIPTION OF THE RELATED ART

9 United States patent no. 5,203,744 utilizes the force of a downward moving participant to
10 stretch a resilient band, commonly termed a bungee cord, to provide the power for oscillating a
11 participant.

12 Additionally, the present inventor created an amusement ride termed RAPID RISER
13 which used a hydraulic system to stretch a resilient band attached to a participant while the
14 participant initially remained on the ground and then lifted the participant with the resilient band.
15 The lifting force produced by the hydraulic system generated the requisite power for then
16 accelerating and decelerating the participant.

17 The RAPID RISER patent application was serial no. 08/012,358; was filed on February
18 1, 1993; and resulted in a Notice of Allowance; but the inventor chose not to obtain a patent,
19 even though the RAPID RISER was commercially produced.

20 Both United States patent no. 5,632,686 and United States patent no. 5,704,841 introduce
21 compressed gas into a bore of a housing to accelerate a piston attached to a cable and thereby
22 accelerate and decelerate a participant. In one mode of operation, the device of United States
23 patent no. 5,704,841 can raise a participant slowly when gas is slowly injected into the bore.

24 And, in one embodiment, the device of United States patent application serial no.
25 09/923269, which was filed on August 3, 2001, introduces fluid into a housing to propel a piston
26 connected to a cable to create the initial force to propel a carrier containing one or more
27 participants.

28 United States patent no. 5,893,802 is very similar to United States patent no. 5,632,686,
29 and United States patent no. 6,001,022 is highly reminiscent of United States patent no.
30 5,704,841.

1 Of the preceding, only United States patent no. 5,203,744 simply utilizes the force of a
2 downward moving participant to provide the initial power to oscillate the participant; and it
3 employs resilient bands or bungee cords.

4 Several patents, *e.g.*, United States patent numbers 5,421,783; 5,649,866; and
5 5,810,671 have a passenger carrier that is accelerated upward by bungee cords and can relatively
6 freely swing about the ends of such cords. There is, however, no control over any rotation of the
7 carrier that does occur.

8 United States patent no. 6,083,111 does involve controlled rotation of a passenger chair
9 (also termed a "support") for an amusement ride. The degree of rotation is, however,
10 purposefully limited; the limited rotation that is possible apparently occurs only over a restricted,
11 fixed portion of a course upon a tower; and only downward movement occurs when the chair has
12 been rotated from its initial substantially vertical position.

13 And United States patent application serial no. 09/922,548, which was filed on August 3,
14 2001, covers a machine-powered seat for an amusement ride that can rotate through a substantial
15 range.

16 Finally, the device of United States patent no. 5,593,368 suspends two resilient bands (or
17 bungee cords) from columns and attaches the free ends of the resilient bands to a participant,
18 preferably near the participant's center of gravity. The columns are placed around a trampoline;
19 and as the participant bounces higher, the point of attachment on the columns is automatically
20 raised. Oscillations are produced primarily by bouncing on the trampoline. The resilient bands
21 do, though, permit a participant to rotate through the participant's own power.

22

1 SUMMARY OF THE INVENTION

2 The present invention employs the force of a downward moving participant to provide
3 the initial power to accelerate and decelerate the participant in an oscillatory manner without the
4 need for a resilient band or bungee cord.

5 A housing, preferably, but not necessarily, a cylindrical housing, having a bore has a
6 piston slidably mounted within the bore. A means, preferably a cable, for transferring force
7 between the piston and a holder for a participant is connected to the piston and to the holder.

8 In a first embodiment, the force transferring means exits the housing through an aperture
9 in a closed first end of the housing. The housing is capable of retaining a compressed fluid
10 between the closed first end and the piston for at least one oscillation of the piston. A
11 compressible fluid, preferably—but not necessarily—a gas and most preferably—but not
12 necessarily—air, is introduced through a fluid supply valve between the piston and the closed
13 first end of the housing.

14 A second end of the housing may be either open or closed.

15 As a participant jumps or falls and thereby allows his or her body to be pulled downward
16 by gravity, the piston is pulled toward the first end of the housing, compressing fluid therein.
17 Eventually the compression of the fluid will stop the downward motion of the housing.
18 Momentum, however, causes the piston to compress the fluid more than is necessary to stop the
19 participant. Therefore, when this momentum is overcome, the fluid is compressed to such an
20 extent that it expands with sufficient force to accelerate the piston away from the first end of the
21 housing and to accelerate the participant upward.

22 If desired, additional fluid can be introduced into the bore of the housing to cause an even
23 greater acceleration of the participant. If sufficient fluid is introduced, the participant is raised
24 beyond the position from which the participant initially began his or her descent.

25 Preferably, but not necessarily, an aperture or, preferably, but not necessarily, a valve is
26 in a side of the housing. This aperture or valve communicates with the bore of the housing and
27 with the atmosphere. As the piston approaches the aperture or the valve (when it is open), fluid
28 may escape from the bore, permitting the piston and the participant to accelerate with less
29 resistance. Once the piston has passed the aperture or valve on its path toward the first end of the
30 housing, the piston begins to compress the fluid as described above.

1 In an alternate embodiment, the cable is continuous. In this embodiment, the cable exits
2 the housing through the aperture in the first end of the housing; re-enters the housing either
3 through the open second end of the housing or, if the second end is closed, through an aperture in
4 the second end; and is attached to the piston. With this embodiment, a first end of a second cable
5 is attached to the cable outside the housing. A second end of this second cable is connected to
6 the holder.

7 In either embodiment, the housing can either be above or below the position from which
8 the participant initially begins his or her descent. Preferably, but not necessarily, the housing is
9 below this point. In such a case, a means, preferably, but not necessarily, a pulley, is employed
10 to change the direction of force exerted by the piston. In the first embodiment, the cable goes
11 across this pulley; in the second embodiment, the second cable goes across this pulley.

12 Preferably, but not necessarily, the Oscillatory Amusement Ride utilizes a single holder
13 but two housings, each having all the components described above with respect to the ride,
14 except, as stated, for the holder.

15 Preferably, but not necessarily, the fluid for each housing is supplied from a common
16 source. A separate line goes to each housing and contains a blocking valve.

17 In the unlikely event that an uncontrolled leak of fluid should arise in a housing between
18 the piston and the first end of the housing, the retarding force of the fluid would be less; so, the
19 cable would move more rapidly. A sensor is preferably, but not necessarily, employed to
20 indicate the loss of pressure caused by the escaping fluid. Preferably, but not necessarily, this is
21 done by having a sensor that measures the speed of the pulley associated with each housing.

22 When the pressure difference between the two housings exceeds a predetermined range, a
23 computer or microprocessor in communication with the sensor and with the blocking valves will
24 cause the line to the housing leaking fluid to close so that the non-leaking housing will not lose
25 fluid and will decelerate the participant.

26 Preferably, but not necessarily, the participant jumps or falls from a movable platform.
27 The platform can be moved by any means that is well known in the art, such as pneumatics,
28 hydraulics, or an electrical or gas-powered motor. If desired, it could be balanced so that it is
29 normally away from the jump position and must be moved into position.

10039903-102601

1 Preferably, but not necessarily, a sensor in communication with the computer or
2 microprocessor detects whether the platform has been moved from the jump position. The
3 computer or microprocessor is in communication with the injection valve and will not allow
4 additional fluid to be injected into a housing until the platform has been moved away from the
5 jump position. This is intended to preclude a participant from being accelerated upward into the
6 platform.

7 If desired, fluid can be injected slowly into the bore of the housing to raise a participant
8 to the platform prior to the participant's jumping or falling from the platform.

9 Preferably, but not necessarily, the cable (the second cable, in the case of the optional
10 embodiment) is rotatably attached to the holder.

11 The holder may be either a harness or a seat.

12 If the holder is a seat, the center of gravity for the seat is kept a sufficient distance below
13 the point of attachment that the seat will not rotate unless a participant rocks it but is also kept
14 sufficiently close to the point of attachment that a participant can rock the seat and thereby rotate
15 it.

16

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the housing which has a non-continuous cable.

Figure 2 portrays the housing with a continuous cable.

Figure 3 shows the Oscillatory Amusement Ride employing two housings.

Figure 4 exhibits blocking valves in the supply lines for two housings of an Oscillatory Amusement Ride.

Figure 5 depicts a harness.

Figure 6 demonstrates a seat used in one embodiment of the Oscillatory Amusement Ride.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As viewed in Figure 1, the Oscillatory Amusement Ride, in a first embodiment, has a housing 1, preferably, but not necessarily, a cylindrical housing, having a bore 2 with a piston 3 slidably mounted within the bore 2.

The housing 1 has a closed first end 4 containing an aperture 5 through which a cable 6 passes. A first end 7 of the cable 6 is connected to the piston 3, and a second end 8 of the cable 6 is attached to a holder 9.

As mentioned above, the housing 1 is capable of substantially retaining a compressed fluid between the closed first end 4 and the piston 3 for at least one oscillation of the piston 3. A compressible fluid, preferably—but not necessarily—a gas and most preferably—but not necessarily—air, is introduced through a fluid supply valve 10 between the piston 3 and the closed first end 4 of the housing 1. Of course, if the fluid is air, the fluid supply valve 10 is not necessary, since, during the interval between operation of the ride, air would slowly but sufficiently enter the bore 2 through the aperture 5. The terminology “closed” with respect to the first end 4 of the housing 1 means, in this document, that such air can leak into the housing 1 but that fluid cannot escape rapidly enough from the first end 4 of said housing 1 substantially to impair the braking action of the fluid upon the piston 3, *i.e.*, as stated earlier in this paragraph, the housing 1 is capable of retaining a compressed fluid between the closed first end 4 and the piston 3 for at least one oscillation of the piston 3..

A second end 11 of the housing 1 may be either open or closed.

Also as discussed above, preferably, but not necessarily, an aperture or valve 12 communicating with the atmosphere and with the bore 2 is in a side 13 of the housing 1.

In an alternate embodiment, which is shown in Figure 2, the cable 6 is continuous. As described above, in this embodiment, the cable 6 exits the housing 1 through the aperture 5 in the closed first end 4 of the housing 1; re-enters the housing 1 either through the open second end 11 of the housing 1 or, if the second end 11 is closed, through an aperture 14 in the second end 11; and is attached to the piston 3. With this embodiment, a first end 15 of a second cable 16 is attached to the cable 6 outside the housing 1. A second end 17 of this second cable 16 is connected to the holder 9. In order to reduce friction, a pulley 18 is located outside the housing 1

10039903-102601

1 near the first end 4 of the housing 1; and another pulley 19 is placed outside the housing 1 near
2 the second end 11 of the housing 1. The cable 6 passes around the pulleys 18, 19.

3 In either embodiment, when the housing 1 is below the position from which the
4 participant initially begins his or her descent, a pulley 20 is employed to change the direction of
5 force exerted by the piston 3. In the first embodiment, the cable 6 goes across this pulley 20; in
6 the second embodiment, the second cable 16 goes across this pulley 20.

7 Preferably, but not necessarily, as seen in Figure 3, the Oscillatory Amusement Ride
8 utilizes a single holder 9 but two housings 1, each having all the components described above
9 with respect to the ride, except, as stated, for the holder 9.

10 Preferably, but not necessarily, as depicted in Figure 4, the fluid for each housing 1 is
11 supplied from a common source 21 which can be any source that is well known in the art, such
12 as a tank or a compressor. A separate line 22 goes to each housing 1 and contains a blocking
13 valve 23.

14 In the unlikely event that an uncontrolled leak of fluid should arise in a housing 1
15 between the piston 3 and the first end 4 of the housing 1 the retarding force of the fluid would be
16 less; so , the cable 6 would move more rapidly. A sensor 24 is preferably, but not necessarily,
17 employed to indicate the loss of pressure caused by the escaping fluid. Preferably, but not
18 necessarily, this is done by having a sensor 24 that measures the speed of the pulley 20
19 associated with each housing 1, when the housings 1 are located below the position from which
20 the participant initially begins his or her descent.

21 When the pressure difference between the two housings 1 exceeds a predetermined range,
22 a computer or microprocessor 25 in communication with the sensor 24 and with the blocking
23 valves 23 will cause the line 22 to the housing 1 leaking fluid to close so that the non-leaking
24 housing 1 will not lose fluid and will decelerate the participant.

25 As indicated previously, preferably, but not necessarily, the participant jumps or falls
26 from a movable platform 26. The platform 26 can be moved by any means that is well known in
27 the art, such as pneumatics, hydraulics, or an electrical or gas-powered motor. If desired, it
28 could be balanced so that it is normally away from the jump position and must be moved into
29 position.

1 Preferably, but not necessarily, a sensor 27 in communication with the computer or
2 microprocessor 25 detects whether the platform 26 has been moved from the jump position. The
3 computer or microprocessor 25 is in communication with the fluid supply valve 10 and will not
4 allow additional fluid to be injected into a housing 1 until the platform 26 has been moved away
5 from the jump position. This is intended to preclude a participant from being accelerated upward
6 into the platform 26.

7 If desired, fluid can be injected by the fluid supply valve 10 or a separate supply valve
8 28, located between the piston 3 and the first end 4 of the housing 1, slowly into the bore 2 of the
9 housing 1 to raise a participant to the platform 26 prior to the participant's jumping or falling
10 from the platform 26. Alternatively, the participant could be so raised; and then the fluid supply
11 valve 10 or separate supply valve 28 could permit the fluid between the piston 3 and the first end
12 4 of the housing 1 to escape so that the participant would fall without ever being on a platform
13 26.

14 Preferably, but not necessarily, the cable 6 (the second cable 16, in the case of the
15 optional embodiment) is rotatably attached to the holder 9.

16 The holder 9 may be either a harness, as shown in Figure 5, or a seat, as depicted in
17 Figure 6.

18 If the holder 9 is a seat, the center of gravity for the seat 9 is kept a sufficient distance
19 below the point of attachment to the cables 6 (or the second cables 16, in the case of the optional
20 embodiment) that the seat 9 will not rotate unless a participant rocks it but is also kept
21 sufficiently close to the point of attachment to the cables 6 (or the second cables 16, in the case
22 of the optional embodiment) that a participant can rock the seat and thereby rotate it. And any
23 means well known in the art, such as a harness or belt, would be used releasably to retain the
24 participant in the seat 9.

25 Preferably, as illustrated in Figure 3, the housings 1 and the movable platform 26 are
26 attached to a structural tower 29.

27 The Oscillatory Amusement Ride could be fastened to the ground; a permanent structure;
28 or a mobile support, such as a truck or a trailer.

29 When communication with the atmosphere is mentioned herein, it is sufficient if such
30 communication is with a tank so large that fluid passing through the element communicating

- 1 with the tank will not change the pressure within the tank sufficiently as to have an appreciable
- 2 negative impact upon the operation of the ride.
- 3

10507 005007 03